

IU0001333 AI for Media Proposal @ YIFAN FENG

AIM

My project is inspired by [Almoji: AI-generated Emoji](#) which explores and enriches an international visual language to communicate human emotions. Taken from its core value of “universality”, my project aims to create new shared identity through producing one popular cultural reference – country & territory flags as a case study. The technical component compares and contrasts two Generative Models: DCGAN and ProGAN to produce different styles of AI flags based on the given dataset. Overall, a total of 270 jpeg images (250 * 250 * 3) will firstly be upsized to (256 * 256 * 3) and put into training process. The final products are documentation of programming scripts, a description of model evaluation, and an outcome interpretation (in .gif or .mp4 format).

TOOLS AND FRAMEWORK

Dataset: <https://www.countryflags.com/>

Framework: [Deep Convolutional GAN \(DCGAN\)](#) or [ProGAN](#)

Programming Environment: python 3.9, including libraries TensorFlow, Keras, Numpy, PIL.Image, Os, CV2 (and more upon requirement)

PLANNING AND FEASIBILITY

The coding script is divided into three parts: data preprocessing, model training and result presentation. Below is the general planning of this project.

1. Preprocessing: Within a for loop, iterate each image and
 - a. resize every file to 256 * 256 pixels with 3 dimensions (RGB)
 - b. rescale each image from RGB 0-255 to 0-1
 - c. add a data augmentation layer as the training set is relatively small
2. Model 1: DCGAN
 - a. Build a discriminator
 - b. Build a generator
 - c. Compile DCGAN
 - d. Define a new function: save_data
3. Model 2: ProGAN
 - a. Downsize image to 128 * 128 *3 to match the requirement from pretrained model: ProGAN-128
 - b. Load new dataset into ProGAN-128
 - c. Define a new function: save_data

References:

- AI4M week 2.1 Neural Network notebook
- AI4M week 2.2 Transfer Learning
- AI4M week 5.1 DCGAN notebook
- AI4M week 5.2 ProGAN notebook

Feedback

Feedback comments

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Seems like a solid proposal Yifan! You have a great plan and seems to me like you have a solid grasp on how to decompose the problem.

You will likely come across some interesting challenges, the small dataset being one which you've already identified. But I think the size of the problem is small enough that you will be able to iterate on ideas quickly, train lots of models and evaluate the outcomes. There might be enough variations to try just with DCGAN, which is fine, but it would be a great comparison to try ProGAN as well. Even comparing results with training time in mind would be interesting to see.

In summary you've got an ideal problem in terms of its scale and the resources you have available to conduct some solid experiments and get results! Looking forward to see the outcome.